

SEQUENCE LISTING

<110> BASF Plant Science GmbH

<120> TER gene of Euglena

<130> AE 20030715

<140> PF 54922

<141> 2003-10-10

<160> 11

<170> PatentIn version 3.1

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<211> 1620

<212> DNA

<213> Euglena gracilis

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<221> CDS

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2

Leu	Cys	Leu	Cys	Val	Ala	Thr	Val	Leu	Leu	Ala	Thr	Gly	Ser	Asn	Pro		
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acc gcc ctg tcc act gct tcc act cgc tct ccg acc tca ctg gtc cgt															144		
Thr	Ala	Leu	Ser	Thr	Ala	Ser	Thr	Arg	Ser	Pro	Thr	Ser	Leu	Val	Arg		
35							40							45			
ggg gtg gac agg ggc ttg atg agg cca acc act gca gcg gct ctg acg															192		
Gly	Val	Asp	Arg	Gly	Leu	Met	Arg	Pro	Thr	Thr	Ala	Ala	Ala	Leu	Thr		
50							55							60			
aca atg aga gag gtg ccc cag atg gct gag gga ttt tca ggc gaa gcc															240		
Thr	Met	Arg	Glu	Val	Pro	Gln	Met	Ala	Glu	Gly	Phe	Ser	Gly	Glu	Ala		
65							70							80			
acg tct gca tgg gcc gcc ggg ccg cag tgg gcg gcg ccg ctc gtg															288		
Thr	Ser	Ala	Trp	Ala	Ala	Gly	Pro	Gln	Trp	Ala	Ala	Pro	Leu	Val			
85							90							95			
gcc gcg gcc tcc tcc gca ctg gcg ctg tgg tgg tgg gcc gcc cgg cgc															336		
Ala	Ala	Ala	Ser	Ser	Ala	Leu	Ala	Leu	Trp	Trp	Trp	Ala	Ala	Arg	Arg		
100							105							110			
agc gtg cgg ccg ctg gca gcg ctg gcg gag ctg ccc acc gcg gtc															384		
Ser	Val	Arg	Arg	Pro	Leu	Ala	Ala	Leu	Ala	Glu	Leu	Pro	Thr	Ala	Val		
115							120							125			
acc cac ctg gcc ccc ccg atg gcg atg ttc acc acc aca gcg aag gtc															432		
Thr	His	Leu	Ala	Pro	Pro	Met	Ala	Met	Phe	Thr	Thr	Ala	Lys	Val			
130							135							140			
atc cag ccc aag att cgt ggc ttc atc tgc acg acc acc cac ccg atc															480		
Ile	Gln	Pro	Lys	Ile	Arg	Gly	Phe	Ile	Cys	Thr	Thr	His	Pro	Ile			
145							150							160			
ggc tgt gag aag cgg gtc cag gag gag atc gcg tac gcc cgt gcc cac															528		
Gly	Cys	Glu	Lys	Arg	Val	Gln	Glu	Ile	Ala	Tyr	Ala	Arg	Ala	His			
165							170							175			
ccg ccc acc agc cct ggc ccg aag agg gtg ctg gtc atc ggc tgc agt															576		
Pro	Pro	Thr	Ser	Pro	Gly	Pro	Lys	Arg	Val	Leu	Val	Ile	Gly	Cys	Ser		
180							185							190			
acc ggc tac ggg ctc tcc acc cgc atc acc gct gcc ttc ggc tac cag															624		
Thr	Gly	Tyr	Gly	Leu	Ser	Thr	Arg	Ile	Thr	Ala	Ala	Phe	Gly	Tyr	Gln		
195							200							205			
gcc gcc acg ctg ggc gtg ttc ctg gcg ggc ccc ccg acg aag ggc cgc															672		
Ala	Ala	Thr	Leu	Gly	Val	Phe	Leu	Ala	Gly	Pro	Pro	Thr	Lys	Gly	Arg		
210							215							220			
ccc gcc gcg ggc tgg tac aac acc gtg gcg ttc gag aag gcc gcc															720		
Pro	Ala	Ala	Ala	Gly	Trp	Tyr	Asn	Thr	Val	Ala	Phe	Glu	Lys	Ala	Ala		
225							230							235			240
ctg gag gcc ggg ctg tac gcc cgg agc ctt aat ggc gac gcc ttc gac															768		

3

Leu Glu Ala Gly Leu Tyr Ala Arg Ser Leu Asn Gly Asp Ala Phe Asp			
245	250	255	
tcc aca acg aag gcg cgg acg gtc gag gcg atc aag cgg gac ctc ggc			816
Ser Thr Thr Lys Ala Arg Thr Val Glu Ala Ile Lys Arg Asp Leu Gly			
260	265	270	
acg gtg gac ctc gtg gtg tac agc atc gcc gcc cgg aag cgg acg gac			864
Thr Val Asp Leu Val Val Tyr Ser Ile Ala Ala Pro Lys Arg Thr Asp			
275	280	285	
cct gcc acc ggc gtc ctc cac aag gcc tgc ctg aag ccc atc ggc gcc			912
Pro Ala Thr Gly Val Leu His Lys Ala Cys Leu Lys Pro Ile Gly Ala			
290	295	300	
acg tac acc aac cgc act gtg aac acc gac aag gcg gag gtg acc gac			960
Thr Tyr Thr Asn Arg Thr Val Asn Thr Asp Lys Ala Glu Val Thr Asp			
305	310	315	320
gtc agc att gag ccg gcc tcc ccc gaa gag atc gcg gac acg gtg aag			1008
Val Ser Ile Glu Pro Ala Ser Pro Glu Glu Ile Ala Asp Thr Val Lys			
325	330	335	
gtg atg ggc ggg gag gac tgg gag ctc tgg atc cag gcg ctg tcg gag			1056
Val Met Gly Gly Glu Asp Trp Glu Leu Trp Ile Gln Ala Leu Ser Glu			
340	345	350	
gcc ggc gtg ctg gcg gag ggg gcc aag acg gtg gcg tac tcc tac atc			1104
Ala Gly Val Leu Ala Glu Gly Ala Lys Thr Val Ala Tyr Ser Tyr Ile			
355	360	365	
ggc ccc gag atg acg tgg cct gtc tac tgg tcc ggc acc atc ggg gag			1152
Gly Pro Glu Met Thr Trp Pro Val Tyr Trp Ser Gly Thr Ile Gly Glu			
370	375	380	
gcc aag aag gac gtg gag aag gct gcc aag cgc atc acg cag cag tac			1200
Ala Lys Lys Asp Val Glu Lys Ala Ala Lys Arg Ile Thr Gln Gln Tyr			
385	390	395	400
ggc tgc ccg gcg tac ccg gtg gtg gcc aag gcc ttg gtc acc cag gcc			1248
Gly Cys Pro Ala Tyr Pro Val Val Ala Lys Ala Leu Val Thr Gln Ala			
405	410	415	
agc tcc gcc atc ccg gtg gtg ccg ctc tac atc tgc ctg ctg tac cgc			1296
Ser Ser Ala Ile Pro Val Val Pro Leu Tyr Ile Cys Leu Leu Tyr Arg			
420	425	430	
gtt atg aag gag aag ggc acc cac gag ggc tgc atc gag cag atg gtg			1344
Val Met Lys Glu Lys Gly Thr His Glu Gly Cys Ile Glu Gln Met Val			
435	440	445	
cgg ctg ctc acc acg aag ctg tac ccc gag aac ggg gcc ccc atc gtc			1392
Arg Leu Leu Thr Thr Lys Leu Tyr Pro Glu Asn Gly Ala Pro Ile Val			
450	455	460	
gat gag gcc gga cgt gtg cgg gtg gat gac tgg gag atg gcg gag gat			1440

4

Asp Glu Ala Gly Arg Val Arg Val Asp Asp Trp Glu Met Ala Glu Asp				
465	470	475	480	
gtg cag cag gct gtt aag gac ctc tgg agc cag gtg agc act gcc aac				1488
Val Gln Gln Ala Val Lys Asp Leu Trp Ser Gln Val Ser Thr Ala Asn				
485	490	495		
ctc aag gac atc tcc gac ttc gct ggg tat caa act gag ttc ctg cgg				1536
Leu Lys Asp Ile Ser Asp Phe Ala Gly Tyr Gln Thr Glu Phe Leu Arg				
500	505	510		
ctg ttc ggg ttc ggc att gac ggc gtg gac tac gac cag ccc gtg gac				1584
Leu Phe Gly Phe Gly Ile Asp Gly Val Asp Tyr Asp Gln Pro Val Asp				
515	520	525		
gtg gag gcg gac ctc ccc agt gct gcc cag cag tag				1620
Val Glu Ala Asp Leu Pro Ser Ala Ala Gln Gln				
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Thr Ala Leu Ser Thr Ala Ser Thr Arg Ser Pro Thr Ser Leu Val Arg				
35	40	45		
Gly Val Asp Arg Gly Leu Met Arg Pro Thr Thr Ala Ala Ala Leu Thr				
50	55	60		
Thr Met Arg Glu Val Pro Gln Met Ala Glu Gly Phe Ser Gly Glu Ala				
65	70	75	80	
Thr Ser Ala Trp Ala Ala Ala Gly Pro Gln Trp Ala Ala Pro Leu Val				
85	90	95		

Ala Ala Ala Ser Ser Ala Leu Ala Leu Trp Trp Trp Ala Ala Arg Arg
100 105 110

Ser Val Arg Arg Pro Leu Ala Ala Leu Ala Glu Leu Pro Thr Ala Val
115 120 125

Thr His Leu Ala Pro Pro Met Ala Met Phe Thr Thr Thr Ala Lys Val
130 135 140

Ile Gln Pro Lys Ile Arg Gly Phe Ile Cys Thr Thr His Pro Ile
145 150 155 160

Gly Cys Glu Lys Arg Val Gln Glu Glu Ile Ala Tyr Ala Arg Ala His
165 170 175

Pro Pro Thr Ser Pro Gly Pro Lys Arg Val Leu Val Ile Gly Cys Ser
180 185 190

Thr Gly Tyr Gly Leu Ser Thr Arg Ile Thr Ala Ala Phe Gly Tyr Gln
195 200 205

Ala Ala Thr Leu Gly Val Phe Leu Ala Gly Pro Pro Thr Lys Gly Arg
210 215 220

Pro Ala Ala Ala Gly Trp Tyr Asn Thr Val Ala Phe Glu Lys Ala Ala
225 230 235 240

Leu Glu Ala Gly Leu Tyr Ala Arg Ser Leu Asn Gly Asp Ala Phe Asp
245 250 255

Ser Thr Thr Lys Ala Arg Thr Val Glu Ala Ile Lys Arg Asp Leu Gly
260 265 270

Thr Val Asp Leu Val Val Tyr Ser Ile Ala Ala Pro Lys Arg Thr Asp
275 280 285

Pro Ala Thr Gly Val Leu His Lys Ala Cys Leu Lys Pro Ile Gly Ala
290 295 300

Thr Tyr Thr Asn Arg Thr Val Asn Thr Asp Lys Ala Glu Val Thr Asp
305 310 315 320

6

Val Ser Ile Glu Pro Ala Ser Pro Glu Glu Ile Ala Asp Thr Val Lys
325 330 335

Val Met Gly Gly Glu Asp Trp Glu Leu Trp Ile Gln Ala Leu Ser Glu
 340 345 350

Ala Gly Val Leu Ala Glu Gly Ala Lys Thr Val Ala Tyr Ser Tyr Ile
355 360 . . 365

Gly Pro Glu Met Thr Trp Pro Val Tyr Trp Ser Gly Thr Ile Gly Glu
 370 375 380

Ala Lys Lys Asp Val Glu Lys Ala Ala Lys Arg Ile Thr Gln Gln Tyr
 385 390 395 400

Gly Cys Pro Ala Tyr Pro Val Val Ala Lys Ala Leu Val Thr Gln Ala
405 410 415

Ser Ser Ala Ile Pro Val Val Pro Leu Tyr Ile Cys Leu Leu Tyr Arg
420 425 430

Val Met Lys Glu Lys Gly Thr His Glu Gly Cys Ile Glu Gln Met Val
435 440 445

Arg Leu Leu Thr Thr Lys Leu Tyr Pro Glu Asn Gly Ala Pro Ile Val
450 455 460

Asp Glu Ala Gly Arg Val Arg Val Asp Asp Trp Glu Met Ala Glu Asp
465 470 475 480

Val Gln Gln Ala Val Lys Asp Leu Trp Ser Gln Val Ser Thr Ala Asn
485 490 495

Leu Lys Asp Ile Ser Asp Phe Ala Gly Tyr Gln Thr Glu Phe Leu Arg
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Leu Phe Gly Phe Gly Ile Asp Gly Val Asp Tyr Asp Gln Pro Val Asp
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Val Glu Ala Asp Leu Pro Ser Ala Ala Gln Gln
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<213> Euglena gracilis

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cggatatctcg gcacggtgga cctcgtggtg tacagcatcg ccgcggcggaa acggacggac 180
cctgccaccg gcgtcgcca caaggcctgc ctgaagccca tcggcgccac ctacaccaac 240
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gaggagatcg ccgacacggcgt gaaggtgatg ggccgggagg actgggagct ttggatccag 360
gcactgtcgg aggccggcgt gctggcggag gggccaaga cggatccata ctcctacatc 420
ggccggaga tgacgtggcc cgtgtactgg tccggcacca ttggggaggc caagaaggac 480
gtggagaagg ccgctaagcg catcacacag cagtacggct gcccagcata cccggatgg 540
gccaaggcct tggtcaccca ggccagctct gccatccgg tggtgccgct ctacatctgc 600
ctgctgtacc gcgttatgaa ggagaaggc acccacgagg gctgcatcga gcagatgg 660
cggtcgctca ccacgaagct gtacccggg aacggttccc ccattgtcga tgaggccgg 720
cggtcgccgg tggatgactg ggagatggcg gaggatgtgc agcaggctgt gaaggaccc 780
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 Leu Leu Arg Thr Gly Ala Val Val Val Asn Ile Ala Thr Ala Val Thr
 20 25 30

cac ctg gcc ccc ccg atg gcg atg ttc acc acc aca gcg aag gtc atc 144
 His Leu Ala Pro Pro Met Ala Met Phe Thr Thr Thr Ala Lys Val Ile
 35 40 45

cag ccc aag att cgt ggc ttc atc tgc acg acc acc cac ccg atc ggc 192
 Gln Pro Lys Ile Arg Gly Phe Ile Cys Thr Thr Thr His Pro Ile Gly
 50 55 60

tgt gag aag cgg gtc cag gag gag atc gcg tac gcc cgt gcc cac ccg 240
 Cys Glu Lys Arg Val Gln Glu Ile Ala Tyr Ala Arg Ala His Pro
 65 70 75 80

ccc acc agc cct ggc ccg aag agg gtg ctg gtc atc ggc tgc agt acc 288
 Pro Thr Ser Pro Gly Pro Lys Arg Val Leu Val Ile Gly Cys Ser Thr
 85 90 95

ggc tac ggg ctc tcc acc cgc atc acc gct gcc ttc ggc tac cag gcc 336
 Gly Tyr Gly Leu Ser Thr Arg Ile Thr Ala Ala Phe Gly Tyr Gln Ala
 100 105 110

gcc acg ctg ggc gtg ttc ctg gcg ggc ccc ccg acg aag ggc cgc ccc 384
 Ala Thr Leu Gly Val Phe Leu Ala Gly Pro Pro Thr Lys Gly Arg Pro
 115 120 125

gcc gcg ggc tgg tac aac acc gtg gcg ttc gag aag gcc gcc ctg 432
 Ala Ala Ala Gly Trp Tyr Asn Thr Val Ala Phe Glu Lys Ala Ala Leu
 130 135 140

gag gcc ggg ctg tac gcc cgg agc ctt aat ggc gac gcc ttc gac tcc 480
 Glu Ala Gly Leu Tyr Ala Arg Ser Leu Asn Gly Asp Ala Phe Asp Ser
 145 150 155 160

aca acg aag gcg cgg acg gtc gag gcg atc aag cgg gac ctc ggc acg 528
 Thr Thr Lys Ala Arg Thr Val Glu Ala Ile Lys Arg Asp Leu Gly Thr
 165 170 175

gtg gac ctc gtg gtg tac agc atc gcc gcc ccg aag cgg acg gac cct 576
 Val Asp Leu Val Val Tyr Ser Ile Ala Ala Pro Lys Arg Thr Asp Pro
 180 185 190

gcc acc ggc gtc ctc cac aag gcc tgc ctg aag ccc atc ggc gcc acg 624
 Ala Thr Gly Val Leu His Lys Ala Cys Leu Lys Pro Ile Gly Ala Thr
 195 200 205

tac acc aac cgc act gtg aac acc gac aag gcg gag gtg acc gac gtc Tyr Thr Asn Arg Thr Val Asn Thr Asp Lys Ala Glu Val Thr Asp Val	672
210 215 220	
 agc att gag ccg gcc tcc ccc gaa gag atc gcg gac acg gtg aag gtg Ser Ile Glu Pro Ala Ser Pro Glu Glu Ile Ala Asp Thr Val Lys Val	720
225 230 235 240	
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245 250 255	
 ggc gtg ctg gcg gag ggg gcc aag acg gtg gcg tac tcc tac atc ggc Gly Val Leu Ala Glu Gly Ala Lys Thr Val Ala Tyr Ser Tyr Ile Gly	816
260 265 270	
 ccc gag atg acg tgg cct gtc tac tgg tcc ggc acc atc ggg gag gcc Pro Glu Met Thr Trp Pro Val Tyr Trp Ser Gly Thr Ile Gly Glu Ala	864
275 280 285	
 aag aag gac gtg gag aag gct gcc aag cgc atc acg cag cag tac ggc Lys Lys Asp Val Glu Lys Ala Ala Lys Arg Ile Thr Gln Gln Tyr Gly	912
290 295 300	
 tgc ccg gcg tac ccg gtg gtg gcc aag gcc ttg gtc acc cag gcc agc Cys Pro Ala Tyr Pro Val Val Ala Lys Ala Leu Val Thr Gln Ala Ser	960
305 310 315 320	
 tcc gcc atc ccg gtg gtg ccg ctc tac atc tgc ctg ctg tac cgc gtt Ser Ala Ile Pro Val Val Pro Leu Tyr Ile Cys Leu Leu Tyr Arg Val	1008
325 330 335	
 atg aag gag aag ggc acc cac gag ggc tgc atc gag cag atg gtg cgg Met Lys Glu Lys Gly Thr His Glu Gly Cys Ile Glu Gln Met Val Arg	1056
340 345 350	
 ctg ctc acc acg aag ctg tac ccc gag aac ggg gcc ccc atc gtc gat Leu Leu Thr Thr Lys Leu Tyr Pro Glu Asn Gly Ala Pro Ile Val Asp	1104
355 360 365	
 gag gcc gga cgt gtg cgg gtg gat gac tgg gag atg gcg gag gat gtg Glu Ala Gly Arg Val Arg Val Asp Asp Trp Glu Met Ala Glu Asp Val	1152
370 375 380	
 cag cag gct gtt aag gac ctc tgg agc cag gtg agc act gcc aac ctc Gln Gln Ala Val Lys Asp Leu Trp Ser Gln Val Ser Thr Ala Asn Leu	1200
385 390 395 400	
 aag gac atc tcc gac ttc gct ggg tat caa act gag ttc ctg cgg ctg Lys Asp Ile Ser Asp Phe Ala Gly Tyr Gln Thr Glu Phe Leu Arg Leu	1248
405 410 415	
 ttc ggg ttc ggc att gac ggc gtg gac tac gac cag ccc gtg gac gtg Phe Gly Phe Gly Ile Asp Gly Val Asp Tyr Asp Gln Pro Val Asp Val	1296
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<211> 442

<212> PRT

<213> Euglena gracilis

<400> 5

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His Leu Ala Pro Pro Met Ala Met Phe Thr Thr Thr Ala Lys Val Ile 45
35 40 45

Gln Pro Lys Ile Arg Gly Phe Ile Cys Thr Thr Thr His Pro Ile Gly 60
50 55 60

Cys Glu Lys Arg Val Gln Glu Glu Ile Ala Tyr Ala Arg Ala His Pro 80
65 70 75 80

Pro Thr Ser Pro Gly Pro Lys Arg Val Leu Val Ile Gly Cys Ser Thr 95
85 90 95

Gly Tyr Gly Leu Ser Thr Arg Ile Thr Ala Ala Phe Gly Tyr Gln Ala 110
100 105 110

Ala Thr Leu Gly Val Phe Leu Ala Gly Pro Pro Thr Lys Gly Arg Pro 125
115 120 125

Ala Ala Ala Gly Trp Tyr Asn Thr Val Ala Phe Glu Lys Ala Ala Leu 140
130 135 140

Glu Ala Gly Leu Tyr Ala Arg Ser Leu Asn Gly Asp Ala Phe Asp Ser 160
145 150 155 160

Thr Thr Lys Ala Arg Thr Val Glu Ala Ile Lys Arg Asp Leu Gly Thr
165 170 175

Val Asp Leu Val Val Tyr Ser Ile Ala Ala Pro Lys Arg Thr Asp Pro
180 185 190

Ala Thr Gly Val Leu His Lys Ala Cys Leu Lys Pro Ile Gly Ala Thr
195 200 205

Tyr Thr Asn Arg Thr Val Asn Thr Asp Lys Ala Glu Val Thr Asp Val
210 215 220

Ser Ile Glu Pro Ala Ser Pro Glu Glu Ile Ala Asp Thr Val Lys Val
225 230 235 240

Met Gly Gly Glu Asp Trp Glu Leu Trp Ile Gln Ala Leu Ser Glu Ala
245 250 255

Gly Val Leu Ala Glu Gly Ala Lys Thr Val Ala Tyr Ser Tyr Ile Gly
260 265 270

Pro Glu Met Thr Trp Pro Val Tyr Trp Ser Gly Thr Ile Gly Glu Ala
275 280 285

Lys Lys Asp Val Glu Lys Ala Ala Lys Arg Ile Thr Gln Gln Tyr Gly
290 295 300

Cys Pro Ala Tyr Pro Val Val Ala Lys Ala Leu Val Thr Gln Ala Ser
305 310 315 320

Ser Ala Ile Pro Val Val Pro Leu Tyr Ile Cys Leu Leu Tyr Arg Val
325 330 335

Met Lys Glu Lys Gly Thr His Glu Gly Cys Ile Glu Gln Met Val Arg
340 345 350

Leu Leu Thr Thr Lys Leu Tyr Pro Glu Asn Gly Ala Pro Ile Val Asp
355 360 365

Glu Ala Gly Arg Val Arg Val Asp Asp Trp Glu Met Ala Glu Asp Val
370 375 380

Gln Gln Ala Val Lys Asp Leu Trp Ser Gln Val Ser Thr Ala Asn Leu
 385 390 395 400

Lys Asp Ile Ser Asp Phe Ala Gly Tyr Gln Thr Glu Phe Leu Arg Leu
 405 410 415

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Glu Ala Asp Leu Pro Ser Ala Ala Gln Gln
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<210> 6

<211> 1212

<212> DNA

<213> Euglena gracilis

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atc tgc acg acc acc cac ccg atc ggc tgt gag aag cgg gtc cag gag 96
 Ile Cys Thr Thr His Pro Ile Gly Cys Glu Lys Arg Val Gln Glu
 20 25 30

gag atc gcg tac gcc cgt gcc cac ccg ccc acc agc cct ggc ccg aag 144
 Glu Ile Ala Tyr Ala Arg Ala His Pro Pro Thr Ser Pro Gly Pro Lys
 35 40 45

agg gtg ctg gtc atc ggc tgc agt acc ggc tac ggg ctc tcc acc cgc 192
 Arg Val Leu Val Ile Gly Cys Ser Thr Gly Tyr Gly Leu Ser Thr Arg
 50 55 60

atc acc gct gcc ttc ggc tac cag gcc acg ctg ggc gtg ttc ctg 240

13

Ile Thr Ala Ala Phe Gly Tyr Gln Ala Ala Thr Leu Gly Val Phe Leu			
65	70	75	80
gct ggc ccc ccg acg aag ggc cgc ccc gcc gct gct ggc tgg tac aac			288
Ala Gly Pro Pro Thr Lys Gly Arg Pro Ala Ala Gly Trp Tyr Asn			
85	90	95	
acc gtg gct ttc gag aag gcc gcc ctg gag gcc ggg ctg tac gcc cgg			336
Thr Val Ala Phe Glu Lys Ala Ala Leu Glu Ala Gly Leu Tyr Ala Arg			
100	105	110	
agc ctt aat ggc gac gcc ttc gac tcc aca acg aag gct cgg acg gtc			384
Ser Leu Asn Gly Asp Ala Phe Asp Ser Thr Thr Lys Ala Arg Thr Val			
115	120	125	
gag gct atc aag cgg gac ctc ggc acg gtg gac ctc gtg gtg tac agc			432
Glu Ala Ile Lys Arg Asp Leu Gly Thr Val Asp Leu Val Val Tyr Ser			
130	135	140	
atc gcc gcc ccc aag cgg acg gac cct gcc acc ggc gtc ctc cac aag			480
Ile Ala Ala Pro Lys Arg Thr Asp Pro Ala Thr Gly Val Leu His Lys			
145	150	155	160
gcc tgc ctg aag ccc atc ggc gcc acg tac acc aac cgc act gtg aac			528
Ala Cys Leu Lys Pro Ile Gly Ala Thr Tyr Thr Asn Arg Thr Val Asn			
165	170	175	
acc gac aag gct gag gtg acc gac gtc acg att gag cgg gcc tcc ccc			576
Thr Asp Lys Ala Glu Val Thr Asp Val Ser Ile Glu Pro Ala Ser Pro			
180	185	190	
gaa gag atc gct gac acg gtg aag gtg atg ggc ggg gag gac tgg gag			624
Glu Glu Ile Ala Asp Thr Val Lys Val Met Gly Gly Glu Asp Trp Glu			
195	200	205	
ctc tgg atc cag gct ctg tcg gag gcc ggc gtg ctg gct gag ggg gcc			672
Leu Trp Ile Gln Ala Leu Ser Glu Ala Gly Val Leu Ala Glu Gly Ala			
210	215	220	
aag acg gtg gct tac tcc tac atc ggc ccc gag atg acg tgg cct gtc			720
Lys Thr Val Ala Tyr Ser Tyr Ile Gly Pro Glu Met Thr Trp Pro Val			
225	230	235	240
tac tgg tcc ggc acc atc ggg gag gcc aag aag gac gtg gag aag gct			768
Tyr Trp Ser Gly Thr Ile Gly Glu Ala Lys Lys Asp Val Glu Lys Ala			
245	250	255	
gcc aag cgc atc acg cag cag tac ggc tgc ccc gct tac ccc gtg gtg			816
Ala Lys Arg Ile Thr Gln Gln Tyr Gly Cys Pro Ala Tyr Pro Val Val			
260	265	270	
gcc aag gcc ttg gtc acc cag gcc agc tcc gcc atc ccc gtg gtg ccc			864
Ala Lys Ala Leu Val Thr Gln Ala Ser Ser Ala Ile Pro Val Val Pro			
275	280	285	
ctc tac atc tgc ctg tac cgc gtt atg aag gag aag ggc acc cac			912

14

Leu Tyr Ile Cys Leu Leu Tyr Arg Val Met Lys Glu Lys Gly Thr His				
290	295	300		
gag ggc tgc atc gag cag atg gtg cggtc acc acg aag ctg tac				960
Glu Gly Cys Ile Glu Gln Met Val Arg Leu Leu Thr Thr Lys Leu Tyr				
305	310	315	320	
ccc gag aac ggg gcc ccc atc gtc gat gag gcc gga cgt gtg cggtg				1008
Pro Glu Asn Gly Ala Pro Ile Val Asp Glu Ala Gly Arg Val Arg Val				
325	330	335		
gat gac tgg gag atg gcg gag gat gtg cag cag gct gtt aag gac ctc				1056
Asp Asp Trp Glu Met Ala Glu Asp Val Gln Gln Ala Val Lys Asp Leu				
340	345	350		
tgg agc cag gtg agc act gcc aac ctc aag gac atc tcc gac ttc gct				1104
Trp Ser Gln Val Ser Thr Ala Asn Leu Lys Asp Ile Ser Asp Phe Ala				
355	360	365		
ggg tat caa act gag ttc ctg cggtc ttggg ttc ggc att gac ggc				1152
Gly Tyr Gln Thr Glu Phe Leu Arg Leu Phe Gly Phe Gly Ile Asp Gly				
370	375	380		
gtg gac tac gac cag ccc gtg gac gtg gag gcg gac ctc ccc agt gct				1200
Val Asp Tyr Asp Gln Pro Val Asp Val Glu Ala Asp Leu Pro Ser Ala				
385	390	395	400	
gcc cag cag tag				1212
Ala Gln Gln				

<210> 7

<211> 403

<212> PRT

<213> Euglena gracilis

<400> 7

Met Phe Thr Thr Ala Lys Val Ile Gln Pro Lys Ile Arg Gly Phe			
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Ile Cys Thr Thr His Pro Ile Gly Cys Glu Lys Arg Val Gln Glu			
20	25	30	

Glu Ile Ala Tyr Ala Arg Ala His Pro Pro Thr Ser Pro Gly Pro Lys			
35	40	45	

15

Arg Val Leu Val Ile Gly Cys Ser Thr Gly Tyr Gly Leu Ser Thr Arg
50 55 60

Ile Thr Ala Ala Phe Gly Tyr Gln Ala Ala Thr Leu Gly Val Phe Leu
65 70 75 80

Ala Gly Pro Pro Thr Lys Gly Arg Pro Ala Ala Ala Gly Trp Tyr Asn
85 90 95

Thr Val Ala Phe Glu Lys Ala Ala Leu Glu Ala Gly Leu Tyr Ala Arg
100 105 110

Ser Leu Asn Gly Asp Ala Phe Asp Ser Thr Thr Lys Ala Arg Thr Val
115 120 125

Glu Ala Ile Lys Arg Asp Leu Gly Thr Val Asp Leu Val Val Tyr Ser
130 135 140

Ile Ala Ala Pro Lys Arg Thr Asp Pro Ala Thr Gly Val Leu His Lys
145 150 155 160

Ala Cys Leu Lys Pro Ile Gly Ala Thr Tyr Thr Asn Arg Thr Val Asn
165 170 175

Thr Asp Lys Ala Glu Val Thr Asp Val Ser Ile Glu Pro Ala Ser Pro
180 185 190

Glu Glu Ile Ala Asp Thr Val Lys Val Met Gly Gly Glu Asp Trp Glu
195 200 205

Leu Trp Ile Gln Ala Leu Ser Glu Ala Gly Val Leu Ala Glu Gly Ala
210 215 220

Lys Thr Val Ala Tyr Ser Tyr Ile Gly Pro Glu Met Thr Trp Pro Val
225 230 235 240

Tyr Trp Ser Gly Thr Ile Gly Glu Ala Lys Lys Asp Val Glu Lys Ala
245 250 255

Ala Lys Arg Ile Thr Gln Gln Tyr Gly Cys Pro Ala Tyr Pro Val Val
260 265 270

16

Ala Lys Ala Leu Val Thr Gln Ala Ser Ser Ala Ile Pro Val Val Pro
275 280 285

Leu Tyr Ile Cys Leu Leu Tyr Arg Val Met Lys Glu Lys Gly Thr His
290 295 300

Glu Gly Cys Ile Glu Gln Met Val Arg Leu Leu Thr Thr Lys Leu Tyr
305 310 315 320

Pro Glu Asn Gly Ala Pro Ile Val Asp Glu Ala Gly Arg Val Arg Val
325 330 335

Asp Asp Trp Glu Met Ala Glu Asp Val Gln Gln Ala Val Lys Asp Leu
340 345 350

Trp Ser Gln Val Ser Thr Ala Asn Leu Lys Asp Ile Ser Asp Phe Ala
355 360 365

Gly Tyr Gln Thr Glu Phe Leu Arg Leu Phe Gly Phe Gly Ile Asp Gly
370 375 380

Val Asp Tyr Asp Gln Pro Val Asp Val Glu Ala Asp Leu Pro Ser Ala
385 390 395 400

Ala Gln Gln

<210> 8

<211> 1803

<212> DNA

<213> Euglena gracilis

<220>

<221> CDS

<222> (1) .. (1803)

<223>

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Met Ala Ser Met Ile Ser Ser Ser Ala Val Thr Thr Val Ser Arg Ala			
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tct acg gtg caa tcg gcc gcg gtg gct cca ttc ggc ggc ctc aaa tcc			96
Ser Thr Val Gln Ser Ala Ala Val Ala Pro Phe Gly Gly Leu Lys Ser			
20	25	30	
atg act gga ttc cca gtt aag aag gtc aac act gac att act tcc att			144
Met Thr Gly Phe Pro Val Lys Lys Val Asn Thr Asp Ile Thr Ser Ile			
35	40	45	
aca .agc aat ggt gga aga gta aag tat tta aat ctc gag atg tcg tgc			192
Thr Ser Asn Gly Gly Arg Val Lys Tyr Leu Asn Leu Glu Met Ser Cys			
50	55	60	
ccc gcc tcg ccg tct gct gcc gtg gtg tct gcc ggc gcc ctc tgc ctg			240
Pro Ala Ser Pro Ser Ala Ala Val Val Ser Ala Gly Ala Leu Cys Leu			
65	70	75	80
tgc gtg gca acg gta ttg ttg gcg act gga tcc aac ccc acc gcc ctg			288
Cys Val Ala Thr Val Leu Ala Thr Gly Ser Asn Pro Thr Ala Leu			
85	90	95	
tcc act gct tcc act cgc tct ccg acc tca ctg gtc cgt ggg gtg gac			336
Ser Thr Ala Ser Thr Arg Ser Pro Thr Ser Leu Val Arg Gly Val Asp			
100	105	110	
agg ggc ttg atg agg cca acc act gca gcg gct ctg acg aca atg aga			384
Arg Gly Leu Met Arg Pro Thr Thr Ala Ala Leu Thr Thr Met Arg			
115	120	125	
gag gtg ccc cag atg gct gag gga ttt tca ggc gaa gcc acg tct gca			432.
Glu Val Pro Gln Met Ala Glu Gly Phe Ser Gly Glu Ala Thr Ser Ala			
130	135	140	
tgg gcc gcc ggg ccg cag tgg gcg ccg ctc gtg gcc ggc gcc			480
Trp Ala Ala Ala Gly Pro Gln Trp Ala Ala Pro Leu Val Ala Ala Ala			
145	150	155	160
tcc tcc gca ctg gcg ctg tgg tgg gcc gcc ccg cgc agc gtg cgg			528
Ser Ser Ala Leu Ala Leu Trp Trp Ala Ala Arg Arg Ser Val Arg			
165	170	175	
cgg ccg ctg gca gcg ctg gcg gag ctg ccc acc gcg gtc acc cac ctg			576
Arg Pro Leu Ala Ala Leu Ala Glu Leu Pro Thr Ala Val Thr His Leu			
180	185	190	
gcc ccc ccg atg gcg atg ttc acc acc aca gcg aag gtc atc cag ccc			624
Ala Pro Pro Met Ala Met Phe Thr Thr Ala Lys Val Ile Gln Pro			
195	200	205	
aag att cgt ggc ttc atc tgc acg acc acc cac ccg atc ggc tgt gag			672
Lys Ile Arg Gly Phe Ile Cys Thr Thr His Pro Ile Gly Cys Glu			
210	215	220	

aag	cgg	gtc	cag	gag	atc	gag	atc	gct	tac	gcc	cgt	gcc	cac	ccg	ccc	acc	720
Lys	Arg	Val	Gln	Glu	Glu	Ile	Ala	Tyr	Ala	Arg	Ala	His	Pro	Pro	Thr		
225				230					235				240				
agc	cct	ggc	ccg	aag	agg	gtg	ctg	gtc	atc	ggc	tgc	agt	acc	ggc	tac	768	
Ser	Pro	Gly	Pro	Lys	Arg	Val	Leu	Val	Ile	Gly	Cys	Ser	Thr	Gly	Tyr		
				245					250			255					
ggg	ctc	tcc	acc	cgc	atc	acc	gct	gcc	ttc	ggc	tac	cag	gcc	gcc	acg	816	
Gly	Leu	Ser	Thr	Arg	Ile	Thr	Ala	Ala	Phe	Gly	Tyr	Gln	Ala	Ala	Thr		
				260					265			270					
ctg	ggc	gtg	ttc	ctg	gag	ccc	ccg	acg	aag	ggc	cgc	ccc	gcc	gag	864		
Leu	Gly	Val	Phe	Leu	Ala	Gly	Pro	Pro	Thr	Lys	Gly	Arg	Pro	Ala	Ala		
				275					280			285					
gag	ggc	tgg	tac	aac	acc	gtg	gag	aag	gcc	gcc	ctg	gag	gcc		912		
Ala	Gly	Trp	Tyr	Asn	Thr	Val	Ala	Phe	Glu	Lys	Ala	Ala	Leu	Glu	Ala		
				290					295			300					
ggg	ctg	tac	gcc	cgg	agc	ctt	aat	ggc	gac	gcc	ttc	gac	tcc	aca	acg	960	
Gly	Leu	Tyr	Ala	Arg	Ser	Leu	Asn	Gly	Asp	Ala	Phe	Asp	Ser	Thr	Thr		
				305					310			315			320		
aag	gag	cg	gtc	gag	gag	atc	aag	cg	gac	ctc	ggc	acg	gtg	gac		1008	
Lys	Ala	Arg	Thr	Val	Glu	Ala	Ile	Lys	Arg	Asp	Leu	Gly	Thr	Val	Asp		
				325					330			335					
ctc	gtg	gtg	tac	agc	atc	gcc	ccg	aag	cg	gac	cct	gcc	acc		1056		
Leu	Val	Val	Tyr	Ser	Ile	Ala	Ala	Pro	Lys	Arg	Thr	Asp	Pro	Ala	Thr		
				340					345			350					
ggc	gtc	ctc	cac	aag	gcc	tgc	ctg	aag	ccc	atc	ggc	acc	tg	acc		1104	
Gly	Val	Leu	His	Lys	Ala	Cys	Leu	Lys	Pro	Ile	Gly	Ala	Thr	Tyr	Thr		
				355					360			365					
aac	cgc	act	gtg	aac	acc	gac	aag	gag	gtg	acc	gac	gtc	agc	att		1152	
Asn	Arg	Thr	Val	Asn	Thr	Asp	Lys	Ala	Glu	Val	Thr	Asp	Val	Ser	Ile		
				370					375			380					
gag	ccg	gcc	tcc	ccc	gaa	gag	atc	gag	acg	gtg	aag	gtg	atg	ggc		1200	
Glu	Pro	Ala	Ser	Pro	Glu	Glu	Ile	Ala	Asp	Thr	Val	Lys	Val	Met	Gly		
				385					390			395			400		
ggg	gag	gac	tgg	gag	ctc	tgg	atc	cag	gag	ctg	tgc	gag	gcc	ggc	gtg	1248	
Gly	Glu	Asp	Trp	Glu	Leu	Trp	Ile	Gln	Ala	Leu	Ser	Glu	Ala	Gly	Val		
				405					410			415					
ctg	gag	ggg	ggc	aag	acg	gtg	gag	atc	gct	tac	atc	ggc	ccc	gg		1296	
Leu	Ala	Glu	Ala	Lys	Thr	Val	Ala	Tyr	Ser	Tyr	Ile	Gly	Pro	Glu			
				420					425			430					
atg	acg	tgg	cct	gtc	tac	tgg	tcc	ggc	acc	atc	ggg	gag	gcc	aag	aag	1344	
Met	Thr	Trp	Pro	Val	Tyr	Trp	Ser	Gly	Thr	Ile	Gly	Glu	Ala	Lys	Lys		
				435					440			445					

gac gtg gag aag gct gcc aag cgc atc acg cag cag tac ggc tgc ccg Asp Val Glu Lys Ala Ala Lys Arg Ile Thr Gln Gln Tyr Gly Cys Pro	1392
450 455 460	
 gcg tac ccg gtg gtg gcc aag gcc ttg gtc acc cag gcc agc tcc gcc Ala Tyr Pro Val Val Ala Lys Ala Leu Val Thr Gln Ala Ser Ser Ala	1440
465 470 475 480	
 atc ccg gtg gtg ccg ctc tac atc tgc ctg ctg tac cgc gtt atg aag Ile Pro Val Val Pro Leu Tyr Ile Cys Leu Leu Tyr Arg Val Met Lys	1488
485 490 495	
 gag aag ggc acc cac gag ggc tgc atc gag cag atg gtg cgg ctg ctc Glu Lys Gly Thr His Glu Gly Cys Ile Glu Gln Met Val Arg Leu Leu	1536
500 505 510	
 acc acg aag ctg tac ccc gag aac ggg gcc ccc atc gtc gat gag gcc Thr Thr Lys Leu Tyr Pro Glu Asn Gly Ala Pro Ile Val Asp Glu Ala	1584
515 520 525	
 gga cgt gtg cgg gtg gat gac tgg gag atg gcg gag gat gtg cag cag Gly Arg Val Arg Val Asp Asp Trp Glu Met Ala Glu Asp Val Gln Gln	1632
530 535 540	
 gct gtt aag gac ctc tgg agc cag gtg agc act gcc aac ctc aag gac Ala Val Lys Asp Leu Trp Ser Gln Val Ser Thr Ala Asn Leu Lys Asp	1680
545 550 555 560	
 atc tcc gac ttc gct ggg tat caa act gag ttc ctg cgg ctg ttc ggg Ile Ser Asp Phe Ala Gly Tyr Gln Thr Glu Phe Leu Arg Leu Phe Gly	1728
565 570 575	
 ttc ggc att gac ggc gtg gac tac gac cag ccc gtg gac gtg gag gcg Phe Gly Ile Asp Gly Val Asp Tyr Asp Gln Pro Val Asp Val Glu Ala	1776
580 585 590	
 gac ctc ccc agt gct gcc cag cag tag Asp Leu Pro Ser Ala Ala Gln Gln	1803
595 600	

<210> 9

<211> 600

<212> PRT

<213> Euglena gracilis

<400> 9

Met Ala Ser Met Ile Ser Ser Ser Ala Val Thr Thr Val Ser Arg Ala	
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Ser Thr Val Gln Ser Ala Ala Val Ala Pro Phe Gly Gly Leu Lys Ser
20 25 30

Met Thr Gly Phe Pro Val Lys Lys Val Asn Thr Asp Ile Thr Ser Ile
35 40 45

Thr Ser Asn Gly Gly Arg Val Lys Tyr Leu Asn Leu Glu Met Ser Cys
50 55 60

Pro Ala Ser Pro Ser Ala Ala Val Val Ser Ala Gly Ala Leu Cys Leu
65 70 75 80

Cys Val Ala Thr Val Leu Leu Ala Thr Gly Ser Asn Pro Thr Ala Leu
85 90 95

Ser Thr Ala Ser Thr Arg Ser Pro Thr Ser Leu Val Arg Gly Val Asp
100 105 110

Arg Gly Leu Met Arg Pro Thr Thr Ala Ala Ala Leu Thr Thr Met Arg
115 120 125

Glu Val Pro Gln Met Ala Glu Gly Phe Ser Gly Glu Ala Thr Ser Ala
130 135 140

Trp Ala Ala Ala Gly Pro Gln Trp Ala Ala Pro Leu Val Ala Ala Ala
145 150 155 160

Ser Ser Ala Leu Ala Leu Trp Trp Ala Ala Arg Arg Ser Val Arg
165 170 175

Arg Pro Leu Ala Ala Leu Ala Glu Leu Pro Thr Ala Val Thr His Leu
180 185 190

Ala Pro Pro Met Ala Met Phe Thr Thr Ala Lys Val Ile Gln Pro
195 200 205

Lys Ile Arg Gly Phe Ile Cys Thr Thr His Pro Ile Gly Cys Glu
210 215 220

Lys Arg Val Gln Glu Glu Ile Ala Tyr Ala Arg Ala His Pro Pro Thr
225 230 235 240

Ser Pro Gly Pro Lys Arg Val Leu Val Ile Gly Cys Ser Thr Gly Tyr
245 250 255

Gly Leu Ser Thr Arg Ile Thr Ala Ala Phe Gly Tyr Gln Ala Ala Thr
260 265 270

Leu Gly Val Phe Leu Ala Gly Pro Pro Thr Lys Gly Arg Pro Ala Ala
275 280 285

Ala Gly Trp Tyr Asn Thr Val Ala Phe Glu Lys Ala Ala Leu Glu Ala
290 295 300

Gly Leu Tyr Ala Arg Ser Leu Asn Gly Asp Ala Phe Asp Ser Thr Thr
305 310 315 320

Lys Ala Arg Thr Val Glu Ala Ile Lys Arg Asp Leu Gly Thr Val Asp
325 330 335

Leu Val Val Tyr Ser Ile Ala Ala Pro Lys Arg Thr Asp Pro Ala Thr
340 345 350

Gly Val Leu His Lys Ala Cys Leu Lys Pro Ile Gly Ala Thr Tyr Thr
355 360 365

Asn Arg Thr Val Asn Thr Asp Lys Ala Glu Val Thr Asp Val Ser Ile
370 375 380

Glu Pro Ala Ser Pro Glu Glu Ile Ala Asp Thr Val Lys Val Met Gly
385 390 395 400

Gly Glu Asp Trp Glu Leu Trp Ile Gln Ala Leu Ser Glu Ala Gly Val
405 410 415

Leu Ala Glu Gly Ala Lys Thr Val Ala Tyr Ser Tyr Ile Gly Pro Glu
420 425 430

Met Thr Trp Pro Val Tyr Trp Ser Gly Thr Ile Gly Glu Ala Lys Lys
435 440 445

Asp Val Glu Lys Ala Ala Lys Arg Ile Thr Gln Gln Tyr Gly Cys Pro
450 455 460

Ala Tyr Pro Val Val Ala Lys Ala Leu Val Thr Gln Ala Ser Ser Ala
465 470 475 480

Ile Pro Val Val Pro Leu Tyr Ile Cys Leu Leu Tyr Arg Val Met Lys
485 490 495

Glu Lys Gly Thr His Glu Gly Cys Ile Glu Gln Met Val Arg Leu Leu
500 505 510

Thr Thr Lys Leu Tyr Pro Glu Asn Gly Ala Pro Ile Val Asp Glu Ala
515 520 525

Gly Arg Val Arg Val Asp Asp Trp Glu Met Ala Glu Asp Val Gln Gln
530 535 540

Ala Val Lys Asp Leu Trp Ser Gln Val Ser Thr Ala Asn Leu Lys Asp
545 550 555 560

Ile Ser Asp Phe Ala Gly Tyr Gln Thr Glu Phe Leu Arg Leu Phe Gly
565 570 575

Phe Gly Ile Asp Gly Val Asp Tyr Asp Gln Pro Val Asp Val Glu Ala
580 585 590

Asp Leu Pro Ser Ala Ala Gln Gln
595 600

<210> 10

<211> 1389

<212> DNA

<213> Euglena gracilis

<220>

<221> CDS

<222> (1) .. (1389)

<223>

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Met Ala Ser Met Ile Ser Ser Ser Ala Val Thr Thr Val Ser Arg Ala			
1	5	10	15
tct acg gtg caa tcg gcc gcg gtg gct cca ttc ggc ggc ctc aaa tcc			96
Ser Thr Val Gln Ser Ala Ala Val Ala Pro Phe Gly Gly Leu Lys Ser			
20	25	30	
atg act gga ttc cca gtt aag aag gtc aac act gac att act tcc att			144
Met Thr Gly Phe Pro Val Lys Lys Val Asn Thr Asp Ile Thr Ser Ile			
35	40	45	
aca agc aat ggt gga aga gta aag tat tta aat atg ttc acc acc aca			192
Thr Ser Asn Gly Gly Arg Val Lys Tyr Leu Asn Met Phe Thr Thr Thr			
50	55	60	
gcg aag gtc atc cag ccc aag att cgt ggc ttc atc tgc acg acc acc			240
Ala Lys Val Ile Gln Pro Lys Ile Arg Gly Phe Ile Cys Thr Thr Thr			
65	70	75	80
cac ccg atc ggc tgt gag aag cgg gtc cag gag gag atc gcg tac gcc			288
His Pro Ile Gly Cys Glu Lys Arg Val Gln Glu Glu Ile Ala Tyr Ala			
85	90	95	
cgt gcc cac ccg ccc acc agc cct ggc ccg aag agg gtg ctg gtc atc			336
Arg Ala His Pro Pro Thr Ser Pro Gly Pro Lys Arg Val Leu Val Ile			
100	105	110	
ggc tgc agt acc ggc tac ggg ctc tcc acc cgc atc acc gct gcc ttc			384
Gly Cys Ser Thr Gly Tyr Gly Leu Ser Thr Arg Ile Thr Ala Ala Phe			
115	120	125	
ggc tac cag gcc gcc acg ctg ggc gtg ttc ctg gcg ggc ccc ccg acg			432
Gly Tyr Gln Ala Ala Thr Leu Gly Val Phe Leu Ala Gly Pro Pro Thr			
130	135	140	
aag ggc cgc ccc gcc gcg ggc tgg tac aac acc gtg gcg ttc gag			480
Lys Gly Arg Pro Ala Ala Ala Gly Trp Tyr Asn Thr Val Ala Phe Glu			
145	150	155	160
aag gcc gcc ctg gag gcc ggg ctg tac gcc cgg agc ctt aat ggc gac			528
Lys Ala Ala Leu Glu Ala Gly Leu Tyr Ala Arg Ser Leu Asn Gly Asp			
165	170	175	
gcc ttc gac tcc aca acg aag gcg cgg acg gtc gag gcg atc aag cgg			576
Ala Phe Asp Ser Thr Thr Lys Ala Arg Thr Val Glu Ala Ile Lys Arg			
180	185	190	
gac ctc ggc acg gtg gac ctc gtg gtg tac agc atc gcc gcc ccg aag			624
Asp Leu Gly Thr Val Asp Leu Val Val Tyr Ser Ile Ala Ala Pro Lys			
195	200	205	
cgg acg gac cct gcc acc ggc gtc ctc cac aag gcc tgc ctg aag ccc			672

24

Arg Thr Asp Pro Ala Thr Gly Val Leu His Lys Ala Cys Leu Lys Pro			
210	215	220	
atc ggc gcc acg tac acc aac cgc act gtg aac acc gac aag gcg gag			720
Ile Gly Ala Thr Tyr Thr Asn Arg Thr Val Asn Thr Asp Lys Ala Glu			
225	230	235	240
gtg acc gac gtc agc att gag ccg gcc tcc ccc gaa gag atc gcg gac			768
Val Thr Asp Val Ser Ile Glu Pro Ala Ser Pro Glu Glu Ile Ala Asp			
245	250	255	
acg gtg aag gtg atg ggc ggg gag gac tgg gag ctc tgg atc cag gcg			816
Thr Val Lys Val Met Gly Gly Glu Asp Trp Glu Leu Trp Ile Gln Ala			
260	265	270	
ctg tcg gag gcc ggc gtg ctg gcg gag ggg gcc aag acg gtg gcg tac			864
Leu Ser Glu Ala Gly Val Leu Ala Glu Gly Ala Lys Thr Val Ala Tyr			
275	280	285	
tcc tac atc ggc ccc gag atg acg tgg cct gtc tac tgg tcc ggc acc			912
Ser Tyr Ile Gly Pro Glu Met Thr Trp Pro Val Tyr Trp Ser Gly Thr			
290	295	300	
atc ggg gag gcc aag aag gac gtg gag aag gct gcc aag cgc atc acg			960
Ile Gly Glu Ala Lys Lys Asp Val Glu Lys Ala Ala Lys Arg Ile Thr			
305	310	315	320
cag cag tac ggc tgc ccg gcg tac ccg gtg gtg gcc aag gcc ttg gtc			1008
Gln Gln Tyr Gly Cys Pro Ala Tyr Pro Val Val Ala Lys Ala Leu Val			
325	330	335	
acc cag gcc agc tcc gcc atc ccg gtg gtg ccg ctc tac atc tgc ctg			1056
Thr Gln Ala Ser Ser Ala Ile Pro Val Val Pro Leu Tyr Ile Cys Leu			
340	345	350	
ctg tac cgc gtt atg aag gag aag ggc acc cac gag ggc tgc atc gag			1104
Leu Tyr Arg Val Met Lys Glu Lys Gly Thr His Glu Gly Cys Ile Glu			
355	360	365	
cag atg gtg cgg ctg ctc acc acg aag ctg tac ccc gag aac ggg gcc			1152
Gln Met Val Arg Leu Leu Thr Thr Lys Leu Tyr Pro Glu Asn Gly Ala			
370	375	380	
ccc atc gtc gat gag gcc gga cgt gtg cgg gtg gat gac tgg gag atg			1200
Pro Ile Val Asp Glu Ala Gly Arg Val Arg Val Asp Asp Trp Glu Met			
385	390	395	400
gcg gag gat gtg cag cag gct gtt aag gac ctc tgg agc cag gtg agc			1248
Ala Glu Asp Val Gln Gln Ala Val Lys Asp Leu Trp Ser Gln Val Ser			
405	410	415	
act gcc aac ctc aag gac atc tcc gac ttc gct ggg tat caa act gag			1296
Thr Ala Asn Leu Lys Asp Ile Ser Asp Phe Ala Gly Tyr Gln Thr Glu			
420	425	430	
ttc ctg cgg ctg ttc ggg ttc ggc att gac ggc gtg gac tac gac cag			1344

25

Phe Leu Arg Leu Phe Gly Phe Gly Ile Asp Gly Val Asp Tyr Asp Gln
435 440 445

ccc gtg gac gtg gag gcg gac ctc ccc agt gct gcc cag cag tag 1389
Pro Val Asp Val Glu Ala Asp Leu Pro Ser Ala Ala Gln Gln
450 455 460

<210> 11

<211> 462

<212> PRT

<213> Euglena gracilis

<400> 11

Met Ala Ser Met Ile Ser Ser Ser Ala Val Thr Thr Val Ser Arg Ala
1 5 10 15

Ser Thr Val Gln Ser Ala Ala Val Ala Pro Phe Gly Gly Leu Lys Ser
20 25 30

Met Thr Gly Phe Pro Val Lys Lys Val Asn Thr Asp Ile Thr Ser Ile
35 40 45

Thr Ser Asn Gly Gly Arg Val Lys Tyr Leu Asn Met Phe Thr Thr Thr
50 55 60

Ala Lys Val Ile Gln Pro Lys Ile Arg Gly Phe Ile Cys Thr Thr Thr
65 70 75 80

His Pro Ile Gly Cys Glu Lys Arg Val Gln Glu Glu Ile Ala Tyr Ala
85 90 95

Arg Ala His Pro Pro Thr Ser Pro Gly Pro Lys Arg Val Leu Val Ile
100 105 110

Gly Cys Ser Thr Gly Tyr Gly Leu Ser Thr Arg Ile Thr Ala Ala Phe
115 120 125

Gly Tyr Gln Ala Ala Thr Leu Gly Val Phe Leu Ala Gly Pro Pro Thr
130 135 140

26

Lys Gly Arg Pro Ala Ala Ala Gly Trp Tyr Asn Thr Val Ala Phe Glu
145 150 155 160

Lys Ala Ala Leu Glu Ala Gly Leu Tyr Ala Arg Ser Leu Asn Gly Asp
165 170 175

Ala Phe Asp Ser Thr Thr Lys Ala Arg Thr Val Glu Ala Ile Lys Arg
180 185 190

Asp Leu Gly Thr Val Asp Leu Val Val Tyr Ser Ile Ala Ala Pro Lys
195 200 205

Arg Thr Asp Pro Ala Thr Gly Val Leu His Lys Ala Cys Leu Lys Pro
210 215 220

Ile Gly Ala Thr Tyr Thr Asn Arg Thr Val Asn Thr Asp Lys Ala Glu
225 230 235 240

Val Thr Asp Val Ser Ile Glu Pro Ala Ser Pro Glu Glu Ile Ala Asp
245 250 255

Thr Val Lys Val Met Gly Gly Glu Asp Trp Glu Leu Trp Ile Gln Ala
260 265 270

Leu Ser Glu Ala Gly Val Leu Ala Glu Gly Ala Lys Thr Val Ala Tyr
275 280 285

Ser Tyr Ile Gly Pro Glu Met Thr Trp Pro Val Tyr Trp Ser Gly Thr
290 295 300

Ile Gly Glu Ala Lys Lys Asp Val Glu Lys Ala Ala Lys Arg Ile Thr
305 310 315 320

Gln Gln Tyr Gly Cys Pro Ala Tyr Pro Val Val Ala Lys Ala Leu Val
325 330 335

Thr Gln Ala Ser Ser Ala Ile Pro Val Val Pro Leu Tyr Ile Cys Leu
340 345 350

Leu Tyr Arg Val Met Lys Glu Lys Gly Thr His Glu Gly Cys Ile Glu
355 360 365

27

Gln Met Val Arg Leu Leu Thr Thr Lys Leu Tyr Pro Glu Asn Gly Ala
370 375 380

Pro Ile Val Asp Glu Ala Gly Arg Val Arg Val Asp Asp Trp Glu Met
385 390 395 400

Ala Glu Asp Val Gln Gln Ala Val Lys Asp Leu Trp Ser Gln Val Ser
405 410 415

Thr Ala Asn Leu Lys Asp Ile Ser Asp Phe Ala Gly Tyr Gln Thr Glu
420 425 430

Phe Leu Arg Leu Phe Gly Phe Gly Ile Asp Gly Val Asp Tyr Asp Gln
435 440 445

Pro Val Asp Val Glu Ala Asp Leu Pro Ser Ala Ala Gln Gln
450 455 460